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**Josypenko**

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(54) **CAPACITATIVELY SHUNTED  
QUADRIFILAR HELIX ANTENNA**

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(58) Field of Search ..... **343/702, 745,  
343/749, 751, 895; H01Q 1/36**

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

**4,554,554 A \* 11/1985 Olesen et al. .... 343/895**  
**5,635,945 A \* 6/1997 McConnell et al. .... 343/895**

**5,721,557 A \* 2/1998 Wheeler et al. .... 343/895**  
**5,793,338 A \* 8/1998 Standke et al. .... 343/895**  
**5,896,113 A \* 4/1999 O'Neill, Jr. .... 343/895**  
**6,094,178 A \* 7/2000 Sanford .... 343/895**  
**6,097,349 A \* 8/2000 Sanford .... 343/895**

\* cited by examiner

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(57) **ABSTRACT**

A quadrifilar helix antenna is provided having a feedpoint for the antenna connecting to individual helical antenna elements. A capacitive network, distributed along the length of the antenna, constitutes a variable frequency shunting network. At each position a first capacitive structure, that may comprise a single capacitor or multiple capacitors in series, interconnects a first pair of opposite antenna elements; a second capacitive structure interconnects the second pair of opposite antenna elements. As an applied frequency increases, the capacitive structures progressively short the opposite antenna elements thereby electrically reducing the antenna length.

**18 Claims, 10 Drawing Sheets**

